# *SHIPMAIN*

## Module 5: Procurement and Installation Execution

# Annual Modernization Program Development

## Annual Programming and Process Guidance

Approved ship changes for procurement and installation

Decision Point 3 (DP3)

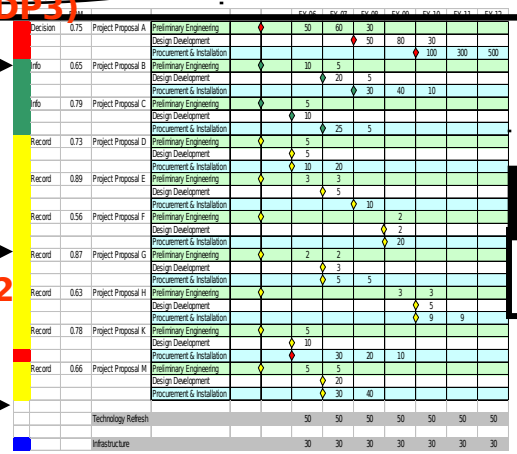
Fund Install

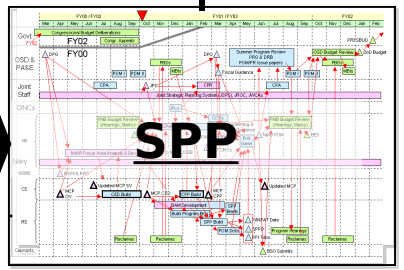
Fund D/D

Decision Point 2 (DP2)

Fund Eng.

Decision Point 1 (DP1)






Maintenance

Modernization

Modernization Plan

FY (a-e)

NDE-NM

MMBP

**Per 100 Ideas:**

- 75 - O6 Level
  - Simple, <$50 M, Non-ACAT
- 20 – 1 / 2 Star Level
  - Complex, >$50 M - <$200 M, ACAT III, IV
- 5 – 3 Star Level
  - Fleet Wide, >$ 200 M, ACAT I, II

Ship Changes once approved, constitute inputs to the Navy's Modernization Plan which then become part of the CNO's Sponsor Program Proposal (SPP) and the President's Budget

# Single FY Modernization Plan Legend

## KEY Stakeholders

- Entitled Process Decision Boards
- SEA 62
- SEA 04
- SPM
- TYCOM
- RMC
- ISIC
- PARM
- FFC/NNWC/CPF

→ **Execution Year**

→ **Planning Year**

## Governing Processes/Instructions

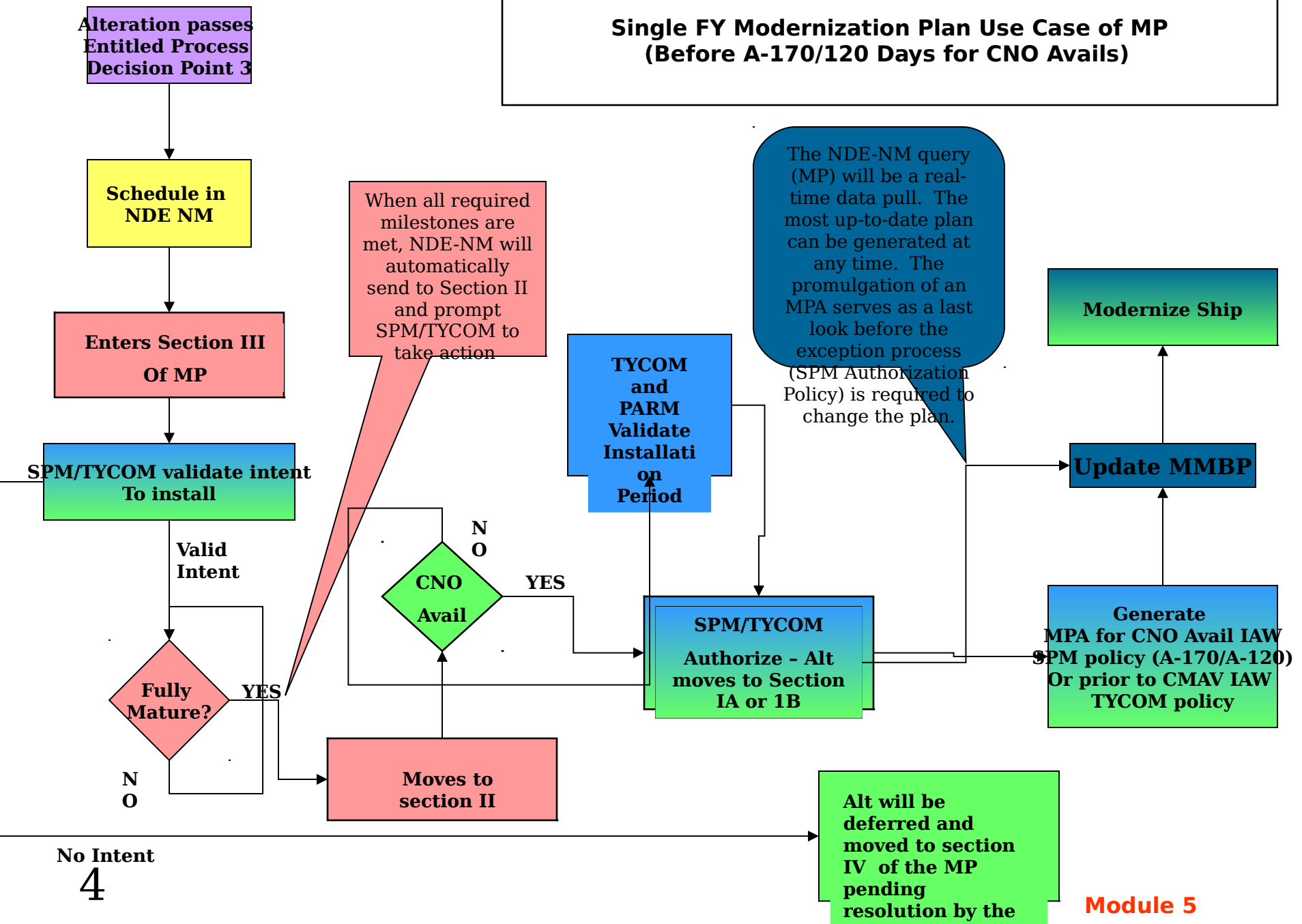
1. **CFT 4 Entitled Process**
2. **CNSF NOTE 4702**
3. **CNSF NOTE 4703**
4. **C5IM Process CFFC MSG 032037ZMAY2004**
5. **CNSF MSG 042106Z NOV 04**

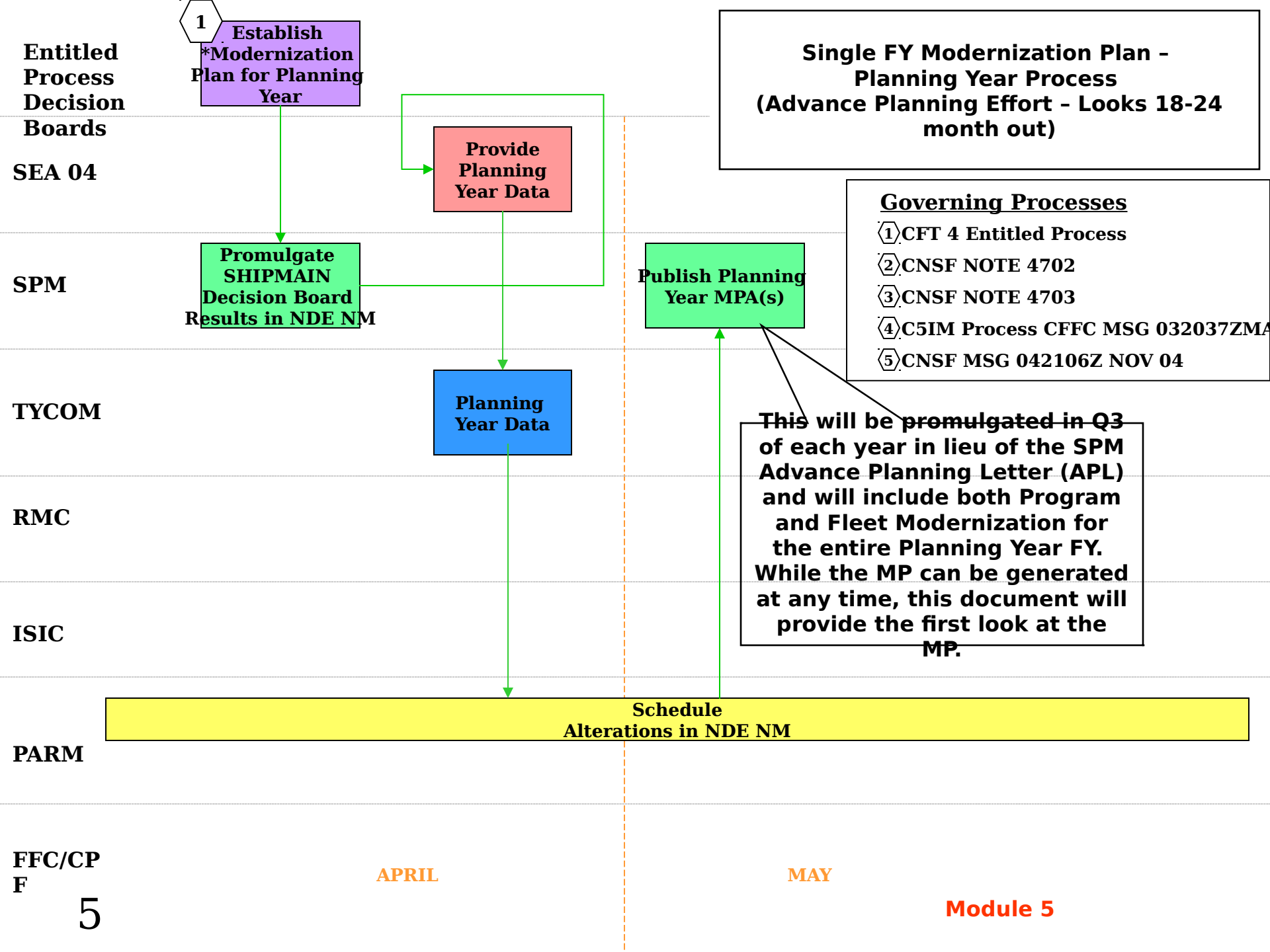
* The Modernization Plan is not a static document and is updated and endorsed continuously by the 3-Star Board.

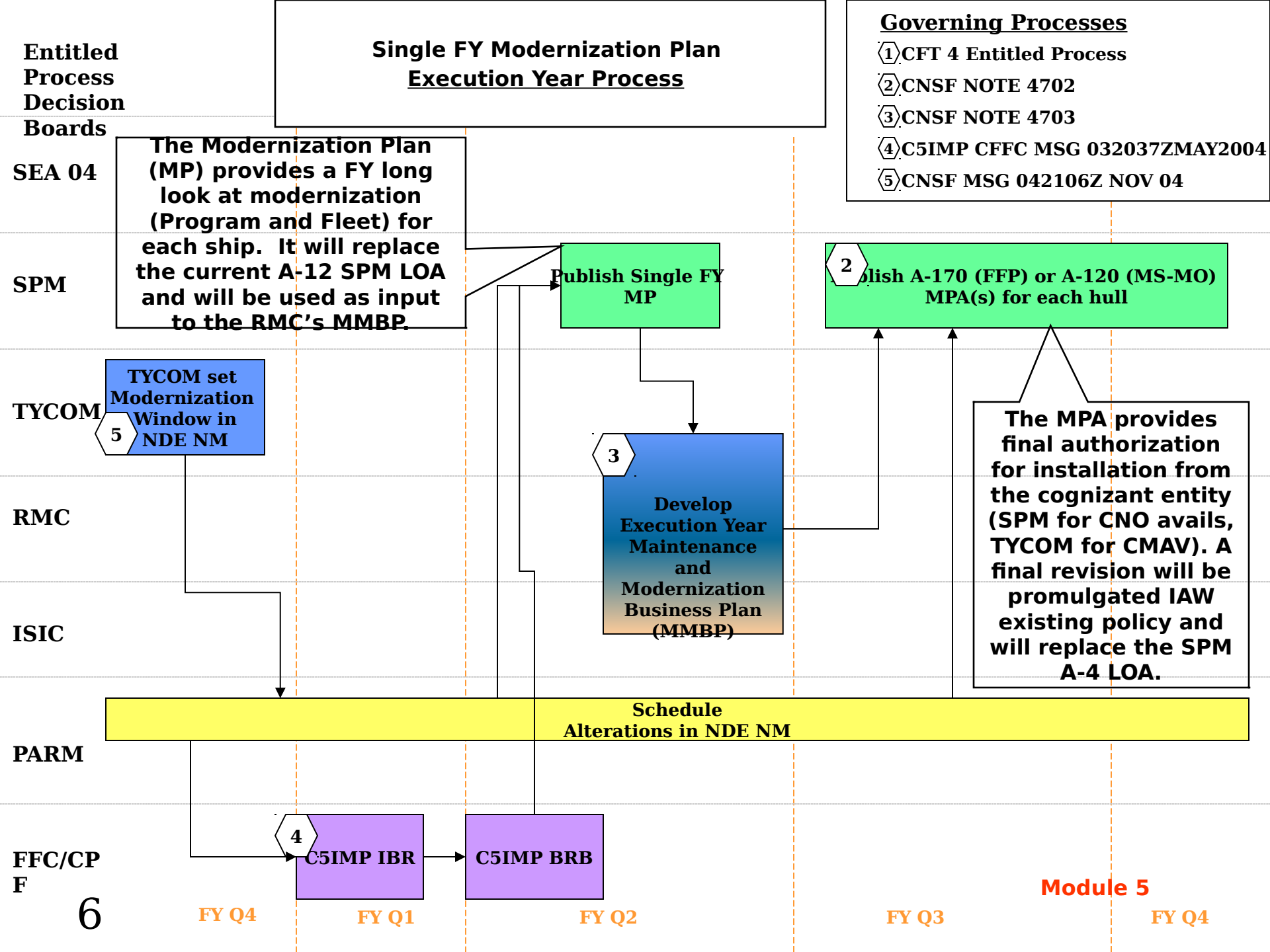
** TYCOM validates the Modernization Windows (MW) in September every year and changes it based on the following:

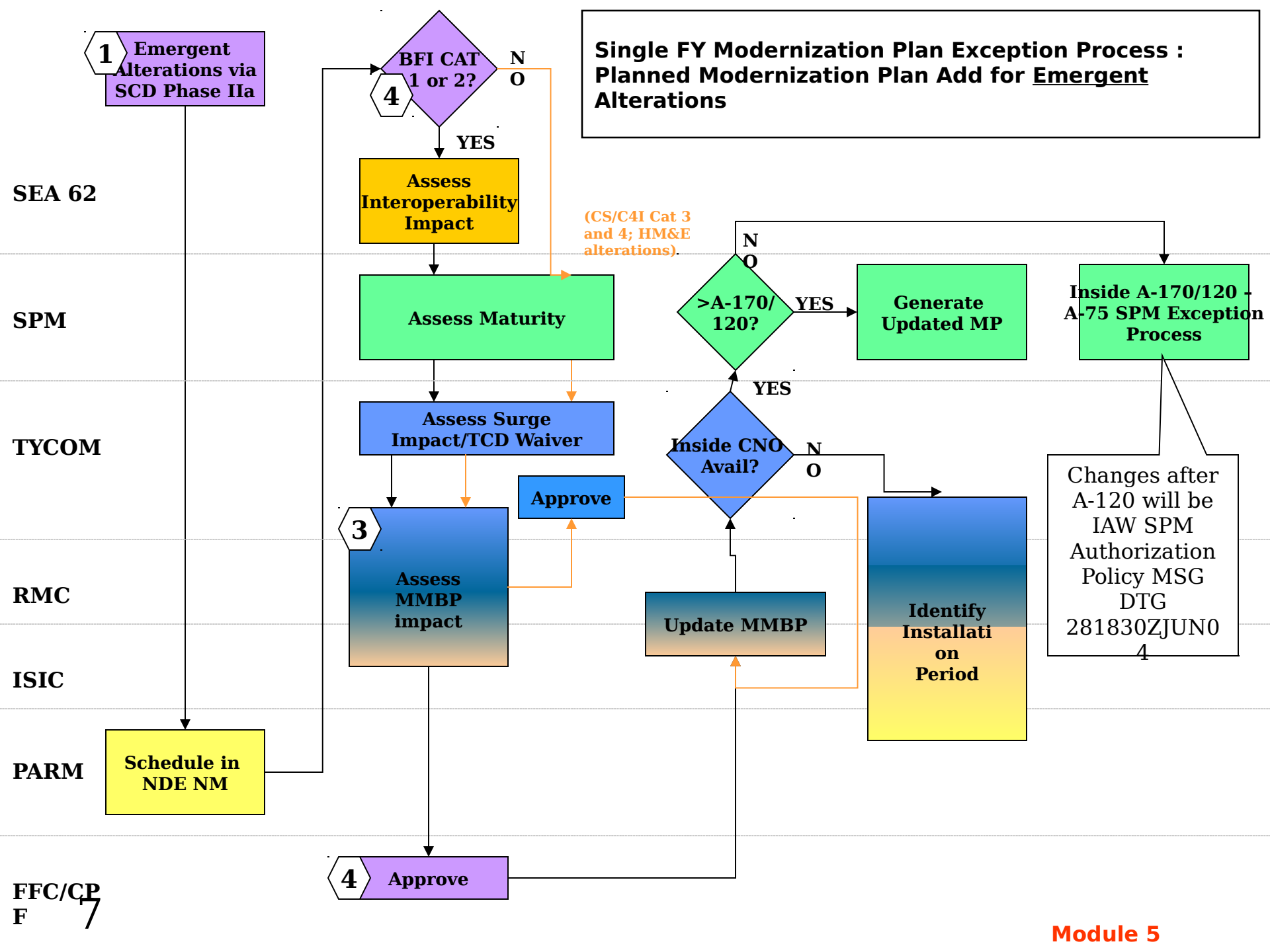
- Surge requirements necessitating a MW outside the defined criteria
- Establishment or change in CNO Availability dates

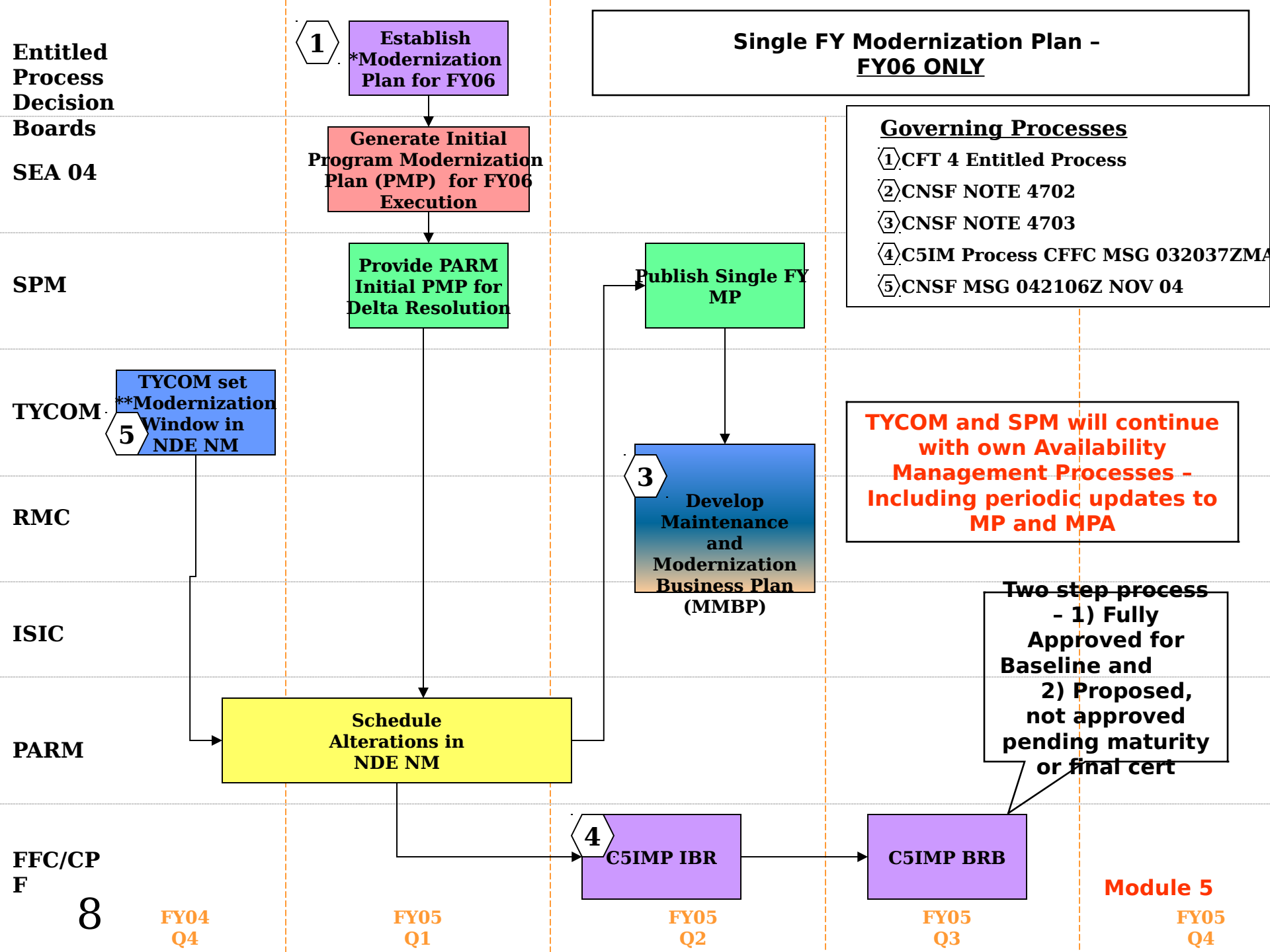
# Single FY Modernization Plan Use Case of MP (Before A-170/120 Days for CNO Avails)


Alteration passes Entitled Process Decision Point 3
Schedule in NDE NM
Enters Section III Of MP
SPM/TYCOM validate intent To install
Valid Intent
Fully Mature?
YES
NO
When all required milestones are met, NDE-NM will automatically send to Section II and prompt SPM/TYCOM to take action
CNO Avail
NO
YES
Moves to section II
No Intent
TYCOM and PARM Validate Installation Period
SPM/TYCOM Authorize – Alt moves to Section IA or 1B
The NDE-NM query (MP) will be a real-time data pull. The most up-to-date plan can be generated at any time. The promulgation of an MPA serves as a last look before the exception process (SPM Authorization Policy) is required to change the plan.
Update MMBP
Modernize Ship
Generate MPA for CNO Avail IAW SPM policy (A-170/A-120) Or prior to CMAV IAW TYCOM policy
Alt will be deferred and moved to section IV of the MP pending resolution by the


Entitled Process Decision Boards
SEA 04
SPM
TYCOM
RMC
ISIC
PARM
FFC/CP F
1
Establish *Modernization Plan for Planning Year
Provide Planning Year Data
Promulgate SHIPMAIN Decision Board Results in NDE NM
Planning Year Data
Publish Planning Year MPA(s)
Schedule Alterations in NDE NM
Single FY Modernization Plan – Planning Year Process (Advance Planning Effort – Looks 18-24 month out)
Governing Processes
1 CFT 4 Entitled Process
2 CNSF NOTE 4702
3 CNSF NOTE 4703
4 C5IM Process CFFC MSG 032037ZMA
5 CNSF MSG 042106Z NOV 04
This will be promulgated in Q3 of each year in lieu of the SPM Advance Planning Letter (APL) and will include both Program and Fleet Modernization for the entire Planning Year FY. While the MP can be generated at any time, this document will provide the first look at the MP.
APRIL
MAY


Entitled Process Decision Boards
Single FY Modernization Plan Execution Year Process
Governing Processes
1 CFT 4 Entitled Process
2 CNSF NOTE 4702
3 CNSF NOTE 4703
4 C5IMP CFFC MSG 032037ZMAY2004
5 CNSF MSG 042106Z NOV 04
SEA 04
The Modernization Plan (MP) provides a FY long look at modernization (Program and Fleet) for each ship. It will replace the current A-12 SPM LOA and will be used as input to the RMC's MMBP.
SPM
Publish Single FY MP
2
blish A-170 (FFP) or A-120 (MS-MO) MPA(s) for each hull
TYCOM
TYCOM set Modernization Window in NDE NM
5
RMC
3
Develop Execution Year Maintenance and Modernization Business Plan (MMBP)
The MPA provides final authorization for installation from the cognizant entity (SPM for CNO avails, TYCOM for CMAV). A final revision will be promulgated IAW existing policy and will replace the SPM A-4 LOA.
ISIC
Schedule Alterations in NDE NM
PARM
4
C5IMP IBR
C5IMP BRB
FFC/CP F
FY Q4
FY Q1
FY Q2
FY Q3
FY Q4
Module 5


Single FY Modernization Plan Exception Process : Planned Modernization Plan Add for Emergent Alterations
SEA 62
SPM
TYCOM
RMC
ISIC
PARM
FFC/CPF
1 Emergent Alterations via SCD Phase IIa
Schedule in NDE NM
BFI CAT 1 or 2?
4
NO
YES
Assess Interoperability Impact
Assess Maturity
Assess Surge Impact/TCD Waiver
3
Assess MMBP impact
4 Approve
(CS/C4I Cat 3 and 4; HM&E alterations)
>A-170/ 120?
NO
YES
Generate Updated MP
Inside A-170/120 - A-75 SPM Exception Process
Inside CNO Avail?
NO
YES
Approve
Update MMBP
Identify Installation Period
Changes after A-120 will be IAW SPM Authorization Policy MSG DTG 281830ZJUN04


Entitled Process Decision Boards
SEA 04
SPM
TYCOM
RMC
ISIC
PARM
FFC/CP F
Single FY Modernization Plan – FY06 ONLY
1
Establish *Modernization Plan for FY06
Generate Initial Program Modernization Plan (PMP) for FY06 Execution
Provide PARM Initial PMP for Delta Resolution
Publish Single FY MP
TYCOM set **Modernization Window in NDE NM
5
3
Develop Maintenance and Modernization Business Plan (MMBP)
Governing Processes
1 CFT 4 Entitled Process
2 CNSF NOTE 4702
3 CNSF NOTE 4703
4 C5IM Process CFFC MSG 032037ZMA
5 CNSF MSG 042106Z NOV 04
TYCOM and SPM will continue with own Availability Management Processes – Including periodic updates to MP and MPA
Two step process – 1) Fully Approved for Baseline and 2) Proposed, not approved pending maturity or final cert
Schedule Alterations in NDE NM
4
C5IMP IBR
C5IMP BRB
Module 5
FY04 Q4
FY05 Q1
FY05 Q2
FY05 Q3
FY05 Q4

# Notional MP Output from NDE-NM

**Sections I, II and III are of primary interest**

**USS VELLA GULF (CG-72) FY05 SRA**
**(19 JAN 05 - 23 MAR 05)**

**AVAILABILITY PLANNING BASELINE**

**TCD: 23 MAY 05**

**Actual MP format is still under development. This is a notional view.**

| ALT IDENTIFIER | CONJ ALTS (SEE NOTE) | ALT BRIEF | ACT | AIT Y/N | ACCOMP START DATE | ACCOMP END DATE | P1 | DP-3/ SCD/ JCF | DP-3/ SCD/ SAR | SID STAT CODE | ILS CERT CODE | CERT | | | | | | NOTES | SPM/TYCOM AUTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **IA. PROGRAM ALTS READY FOR INSTALL** | | | | | | | | **GREEN ZONE** | | | | | | | | | | | |
| **SRA 19JAN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 590K | | POLLUTION PREVENTION AFLOAT | PEO SHIPS | Y | 1/19/2005 | 3/23/2005 | 81HF | ######## | ######## | C | CR | | N/A | | G | Y | B | | X |
| 639K | | EHF FOT | SPA | Y | 1/19/2005 | 3/23/2005 | 52NR | 4/3/2001 | ######## | C | CR | | B | 1 | G | Y | B | | X |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| FC 155 SWBD,MAIN IC NO. 1 | 670K (W) | MOD TO SUPPORT NAVSSI BLK 4 | | | 1/19/2005 | 3/23/2005 | | | | | | Proof-In | B | 2 | N/A | Y | I | | X |
| **IB. FLEET ALTS READY FOR INSTALL** | | | | | | | | | | | | | | | | | | | |
| **SRA 19JAN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 657D | | MK38 MOD 1 25MM CHAIN GUNS | | | 1/31/2005 | 4/15/2005 | 1B5B | ######## | ######## | C | CR | | N | 2 | G | Y | A | | X |
| 674D | | ATFP EQUIPMENT INSTALL | | | 1/31/2005 | 4/15/2005 | 1B5B | ######## | ######## | C | CR | | N/A | 4 | G | Y | A | | X |
| 677D | | TORP FIRING DOOR ACCUMULATOR | | | ######## | ######## | 1B5B | ######## | ######## | C | CR | | N/A | 4 | N/A | Y | B | | X |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| AUD AEGIS MWT SRV05 | | AEGIS MICROWAVE TUBE SURVEY | | | 8/5/2005 | 6/27/1905 | | | | | | | N/A | | N/A | Y | A | | X |
| **II. ALTS REQUIRING SPM/TYCOM ACTION** | | | | | | | | **PINK ZONE** | | | | | | | | | | | |
| EC 136 AN/SSQ-89 | | SSQ-89 OBT FILL 5 | | | 1/19/2005 | 3/23/2005 | | | | | CR | Certified | B | 2 | | Y | A | | |
| FC 2 AN/USQ-148V(V)2 | | REPLACE CISCO 4500 ROUTER | | | | | | | | | | Certified | B | 1 | | Y | A | **Can be authorized;** | |
| **III. DP 3 ALTS AWAITING MATURITY** | | | | | | | | **YELLOW ZONE** | | | | | | | | | | | |
| SWD TTWCS 6.3.5 TOMAHAWK | 358K (W), 636K (W) | TTWCS V4 I6.3.5 SW | | | 1/19/2005 | 3/23/2005 | | | | | CR | Certified | B | 1 | N/A | Y | A | **Can be authorized** | |
| OA 20299 | | IMPROVED ANTENNA HEATERS | | | 1/19/2005 | 3/23/2005 | | | | | | Under Prep | N/A | 4 | N/A | Y | A | | |
| **IV. ALTS DEFERRED OR PREVIOUSLY SKED IN FY (DSA/PY):** | | | | | | | | **GRAY ZONE** | | | | | | | | | | | |
| 399.02K | | FUEL OIL TANK STIFFENING | PEO SHIPS | N | | | 1B5B | 7/9/1992 | 8/4/1994 | C | CR | N | N/A | 4 | N/A | **Y** | B | BEING CANCELLED | |
| 399.03K | | FUEL OIL TANK STIFFENING | PEO SHIPS | N | | | 1B5B | 7/9/1992 | 8/4/1994 | C | CR | N | N/A | 4 | N/A | **Y** | B | BEING CANCELLED | |
| **V. DP 2 ALTS** | | | | | | | | **WHITE ZONE** | | | | | | | | | | | |
| **VI. DP 1 ALTS** | | | | | | | | **WHITE ZONE** | | | | | | | | | | | |

# Notional MP Output from NDE-NM

**A = Scheduled and applicable, B= Programmed – must be properly scheduled IAW SPM Authorization Policy**

**USS VELLA GULF (CG-72) FY05 SRA (19 JAN 05 - 23 MAR 05)**

**AVAILABILITY PLANNING BASELINE**

**Validated and approved by SPM (Program Alts) or TYCOM (Fleet Alts) – Required to transition to section 1**

| ALT IDENTIFIER | CONJ ALTS (SEE NOTE) | ALT BRIEF | ACT | AIT Y/N | ACCOMP START DATE | ACCOMP END DATE | P1 | DP-3/ SCD/ JCF | DP-3/ SCD/ SAR | SID STAT CODE | ILS CERT CODE | CERT | C5I B/L | BFI CAT | MATL STAT | ON NDE-NM | APP STAT CODE | NOTES | SPM/TYCOM AUTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **IA. PROGRAM ALTS READY FOR INSTALL** | | | | | | | | **GREEN ZONE** | | | | | | | | | | | |
| **SRA 19J AN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 590K | | | | Y | 1/19 | 3/23/2005 | HF | ######## | ######## | | CR | | | 4 | G | Y | B | | X |
| 639K | | EHF POT | | Y | 1 | 3/23/2005 | NR | 4/3/2001 | ######## | | CR | | | 1 | G | | B | | X |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| FC 155 SWBD,MAIN IC NO. 1 | 670K (W) | MOD TO S | | | 5 | 3/23/2005 | | | | | | Proof-I | | 2 | N/A | Y | I | | X |
| **IB. FLEET ALTS READY FOR INSTALL** | | | | | | | | | | | | | | | | | | | |
| **SRA 19J AN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 657D | | MK38 MOD 1 25MM ( | | | | | B | ######## | ###### | | CR | | N | 2 | G | Y | | | X |
| 674D | | ATFP EQUIPMENT IN | | | | | B | ######## | ###### | | CR | | | | | | | | X |
| 677D | | TORP FIRING DOOR | | | | | B | ######## | ###### | | CR | | | | | | B | | X |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| AUD AEGIS MWT SRV05 | | AEGIS MICROWAVE TUBE SURVEY | | | 8/5/2005 | 8/30 | | | | | | | | | | | A | | X |
| **II. MATURITY SCREENING** | | | | | | | | **NK ZO** | | | | | | | | | | | |
| EC 136 AN/SSQ-89 | | SSQ-89 OBT FILL 5 | | | | | | | | | CR | | | | | | | | |
| FC 2 AN/USQ-148V(V)2 | | REPLACE CISCO 4500 ROUTER | | | | | | | | | | | | | | | | | |
| **III. DP 3 ALTS AWAITING MATURITY** | | | | | | | | **YELLOW** | | | | | | | | | | | |
| SWD TTWCS 6.3.5 TOMAHAWK | 358K (W), 636K (W) | TTWCS V4 I6.3.5 SW | | | 1/19/2005 | 3/23/2005 | | | | | B | Certified | B | 1 | N/A | Y | | | |
| OA 20299 | | IMPROVED ANTENNA HEATERS | | | | | | | | | | rep | N/A | 4 | N/A | Y | | | |
| **IV. ALTS DEFERRED OR PREVIOUSLY SKED IN FY (DSA/PY):** | | | | | | | | | | | | | | | | | | | |
| 399.02K | | FUEL OIL TANK STIFFENING | PEO SHIPS | | | | | | | | | | N/A | 4 | N/A | **Y** | | | |
| 399.03K | | FUEL OIL TANK STIFFENING | PEO SHIPS | | | | | | | | | | N/A | 4 | N/A | **Y** | | | |
| **V. DP 2 ALTS** | | | | | | | | | | | | | | | | | | | |
| **VI. DP 1 ALTS** | | | | | | | | | | | | | | | | | | | |

**PARM (SYSCOM)**

**AIT Installation (Y/N)**

**Installation Schedule – During CNO Avail or scheduled CMAV?**

**P1 Funding Line**

**Fleet Commander's C5IMP Baseline for BFI CAT 1 and 2 Alts**

**HSC tracks all GFM to include HCPM**

**Hardware Systems Command (HSC) Material Status (Includes HCPM)– Estimated Deliver Date (EDD) before start of avail**

**FMP Milestones of JCF, SAR, SIDs and ILS for Legacy Alts, . May also include alt certification (As applicable for FC, EC etc). SCD DP 3 and SIDs for Entitled Process. FMP and SPM LOA policy applies for maturity milestones**

Ship Changes that reach Decision Point 3 are fully funded

# Notional MP Output from NDE-NM

Ship Change Maturity includes completion of all Certs. to include ILS, WSESRB, EMI, etc.

Section I – Fully mature and SPM (IA) or TYCOM (IB) authorized for installation.

## USS VELLA GULF (CG-72) FY05 SRA (19 JAN 05 - 23 MAR 05)

## AVAILABILITY PLANNING BASELINE

## TCD: 23 MAY 05

Section II – Alts or SCs that have passed Decision Point 3 and are fully mature. SPM (Program Alts) or TYCOM (Fleet Alts) will validate and take action to authorize for installation

Section III – Alts or SCs that have passed Decision Point 3 but have not achieved full maturity. These items are to be considered planned, but not authorized for installation. Once full maturity is achieved, they will transition to section II

Section IV – Alts that were previously scheduled for a CNO Avail, but have been deferred – this section is for tracking purposes only

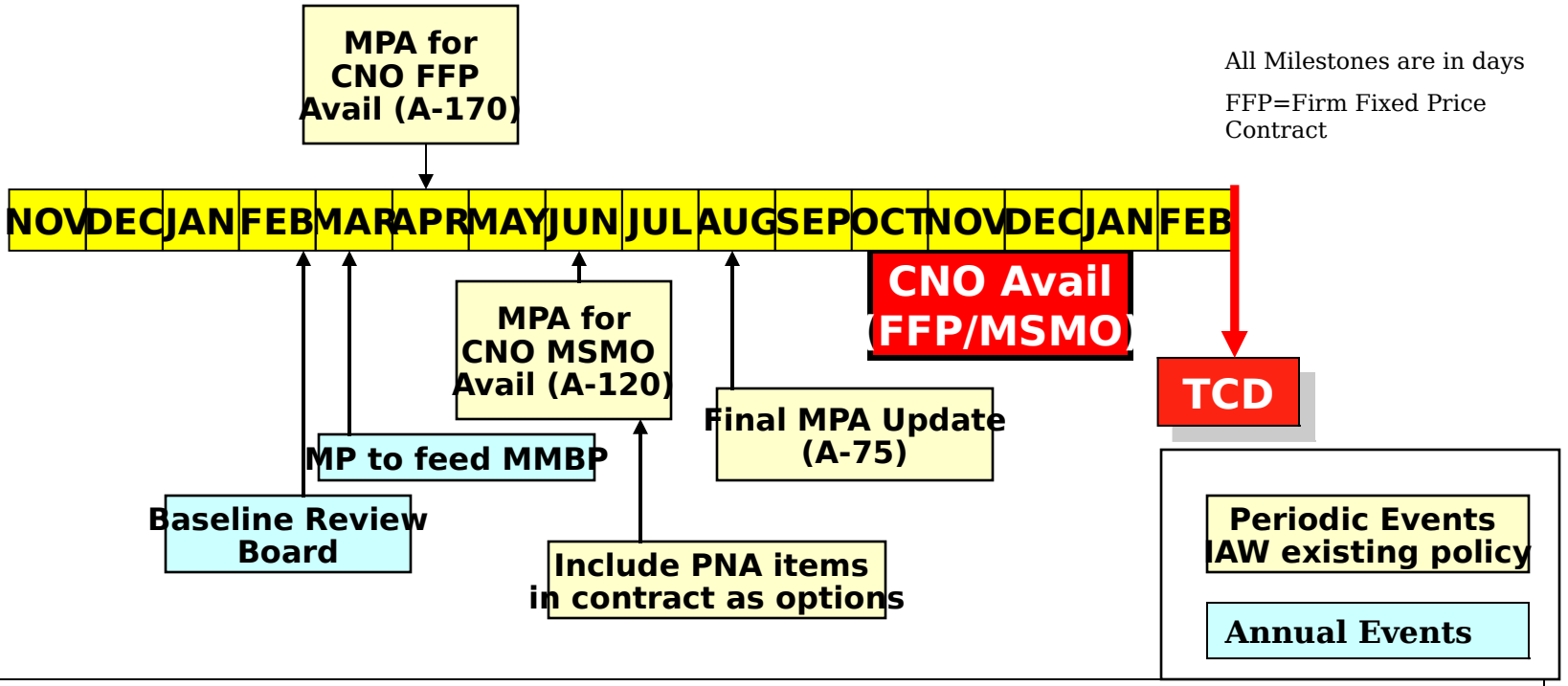
Section V and VI – Other Ship Changes planned for the ship but have not reached Decision Point 3

| ALT IDENTIFIER | CONJ ALTS (SEE NOTE) | ALT BRIEF | ACT | AIT Y/N | ACCOMP START DATE | ACCOMP END DATE | P1 | DP-3/ SCD/ JCF | DP-3/ SCD/ SAR | SID STAT CODE | IC CO | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **IA. PROGRAM ALTS READY FOR INSTALL** | | | | | | | | **GREEN ZONE** | | | | | | | | | | | |
| **SRA 19JAN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 590K | | POLLUTION PREVENTION AFLOAT | PEO SHIPS | Y | 1/19/2005 | 3/23/2005 | 81HF | ######## | ######## | C | CP | | | 4 | G | Y | B | | X |
| 639K | | EHF FOT | SPA | Y | 1/19/2005 | 3/23/2005 | 52NR | 4/3/2001 | ######## | | | | B | 1 | G | Y | B | | X |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| FC 155 SWBD,MAIN IC NO. 1 | 670K (W) | MOD TO SUPPORT NAVSSI BLK 4 | | | 1/19/2005 | 3/23/2005 | | | | | | | | | | | | | |
| **IB. FLEET ALTS READY FOR INSTALL** | | | | | | | | | | | | | | | | | | | |
| **SRA 19JAN05-23MAR05** | | | | | | | | | | | | | | | | | | | |
| 657D | | MK38 MOD 1 25MM CHAIN GUNS | | | [illegible] | 4/15/2005 | 1B5B | ######## | ######## | C | | | | | | | | | |
| 674D | | ATFP EQUIPMENT INSTALL | | | 1/31/2005 | 4/15/2005 | 1B5B | ######## | ######## | C | | | | | | | | | |
| 677D | | TORP FIRING DOOR ACCUMULATOR | | | ######## | ######## | 1B5B | ######## | ######## | C | | | | | | | | | |
| **CMAV 8/5/05 - 8/30/05** | | | | | | | | | | | | | | | | | | | |
| AUD AEGIS MWT SRV05 | | AEGIS MICROWAVE TUBE SURVEY | | | 8/5/2005 | 8/30/2005 | | | | | | | | | | | | | |
| **II. ALTS REQUIRING SPM/TYCOM ACTION** | | | | | | | | [illegible] ZONE | | | | | | | | | | | |
| EC 136 AN/SSQ-89 | | SSQ-89 OBT FILL 5 | | | | [illegible]/2005 | | | | | | | | | | | | | |
| FC 2 AN/USQ-148V(V)2 | | REPLACE CISCO 4500 ROUTER | | | | | | | | | | Certified | B | 1 | | Y | A | Can be authorized; | |
| **III. DP 3 ALTS AWAITING MATURITY** | | | | | | | | **YELLOW ZONE** | | | | | | | | | | | |
| SWD TTWCS 6.3.5 TOMAHAWK | 358K (W), 636K (W) | TTWCS V4 I6.3.5 SW | | | 1/19/2005 | 3/23/2005 | | | | | | | | | | | | | |
| OA 20299 | | IMPROVED ANTENNA HEATERS | | | 1/19/2005 | 3/23/2005 | | | | | | | | | | | | | |
| **IV. ALTS DEFERRED OR PREVIOUSLY SKED IN FY (DSA/PY):** | | | | | | | | | | | | | | | | | | | |
| 399.02K | | FUEL OIL TANK STIFFENING | PEO SHIPS | N | | | 1B5B | 7/9/1992 | 8/4/1994 | C | | | | | | | | | |
| 399.03K | | FUEL OIL TANK STIFFENING | PEO SHIPS | N | | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | DEING CANCELLED | |
| **V. DP 2 ALTS** | | | | | | | | | | | | | | | | | | | |
| **VI. DP 1 ALTS** | | | | | | | | **WHITE ZONE** | | | | | | | | | | | |

# Documentation and Terminology Evolution

| OLD | | NEW |
|---|---|---|
| •APL | → | •Real-Time MP |
| •LOA | → | •MPA: will provide final plan (not including Emergent Ship Changes) |
| • A-120 Letter | | |

# Single LOA Timeline


MPA for CNO FFP Avail (A-170)
All Milestones are in days
FFP=Firm Fixed Price Contract
NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB
CNO Avail (FFP/MSMO)
TCD
MPA for CNO MSMO Avail (A-120)
Final MPA Update (A-75)
MP to feed MMBP
Baseline Review Board
Include PNA items in contract as options
Periodic Events IAW existing policy
Annual Events

- Modernization Plan (MP) is “snapshot” in March to support development of RMC’s Maintenance and Modernization Business Plan
- MP is an NDE-based planning tool, <u>not</u> authorization to install, and will remain dynamic with alts moving between sections as they mature
- SPM LOA policy for locking avail package is IAW existing policy – Modernization Plan Authorization (derived from MP Snapshot) issued at key milestones to document maturity status for availability planning (A-170 (FFP), A-120, A-75)
- CMAVs IAW governing TYCOM and RMC policies

# Vision of Entitlement

**We must “install what we buy” in a TIME driven manner**

**1. View modernization as a set of interconnected processes not stove-piped functions!**

**GOAL of Entitlement is to reduce Modernization Process Variability and Increase Efficiency to a High Level**

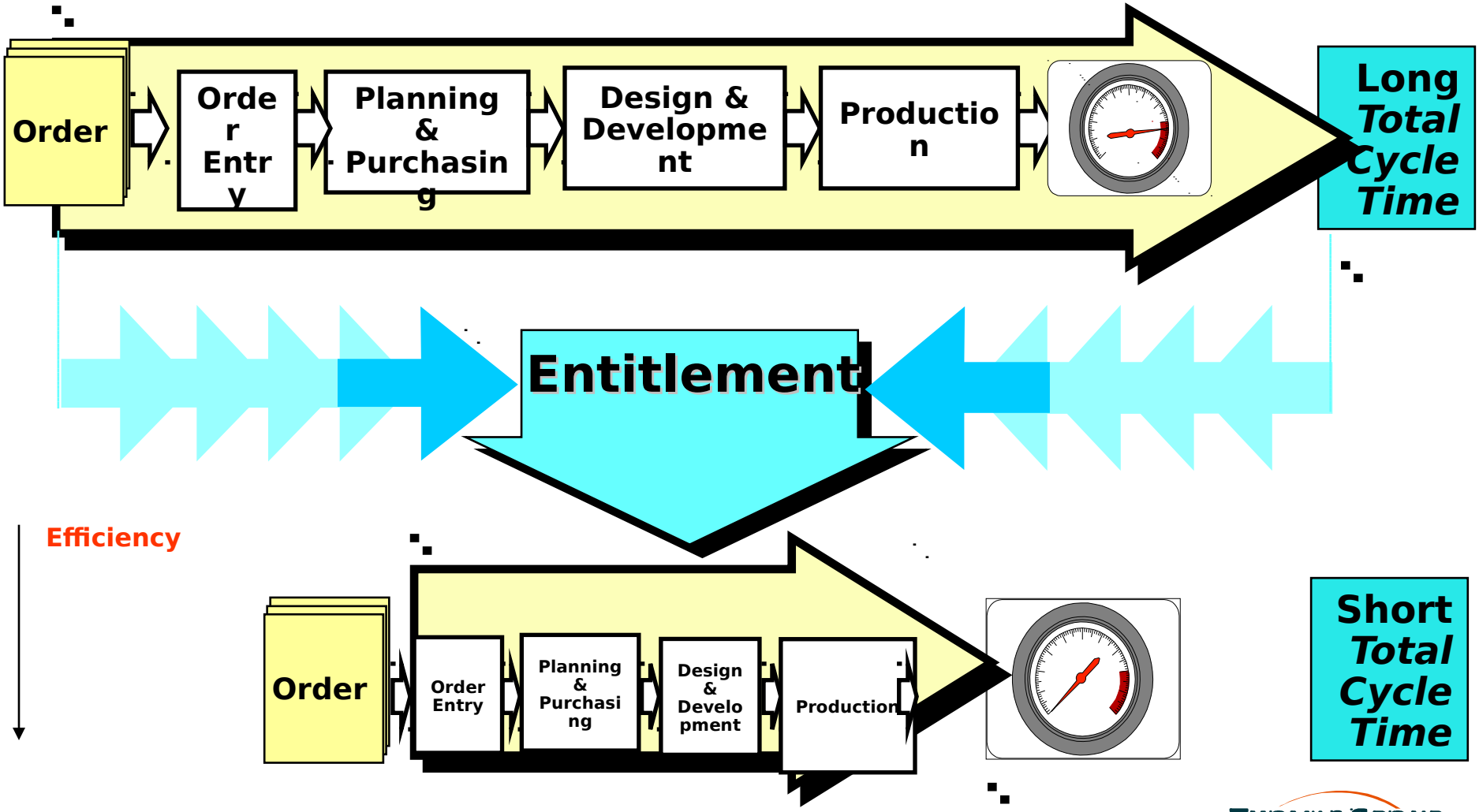
**2. ss**

**management!**

THOMAS GROUP

# Operational Meaning of Entitlement

***combined effect of the cycle times of all business processes from the time a need exists until it is satisfied.***



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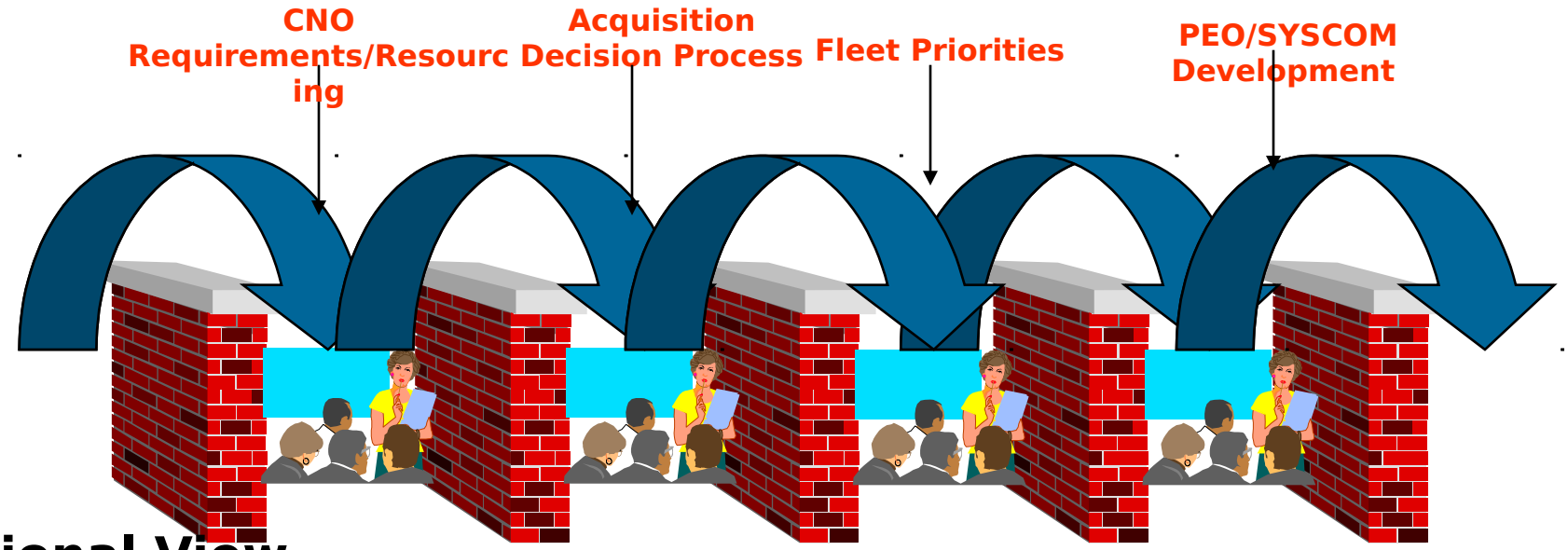


**Functional View (FMP Today): Incoherent and fragmented**

CFT-4

- Map Process
- ID Metrics
- ID Current Baseline
- Define Entitlement
- ID Barriers

SCD

Single Database

Single Review Process

CNO/Fleet Decision Process

Link to Fleet Priorities; Acquisition

**Process View (Entitlement): Total Visibility & Efficiency**



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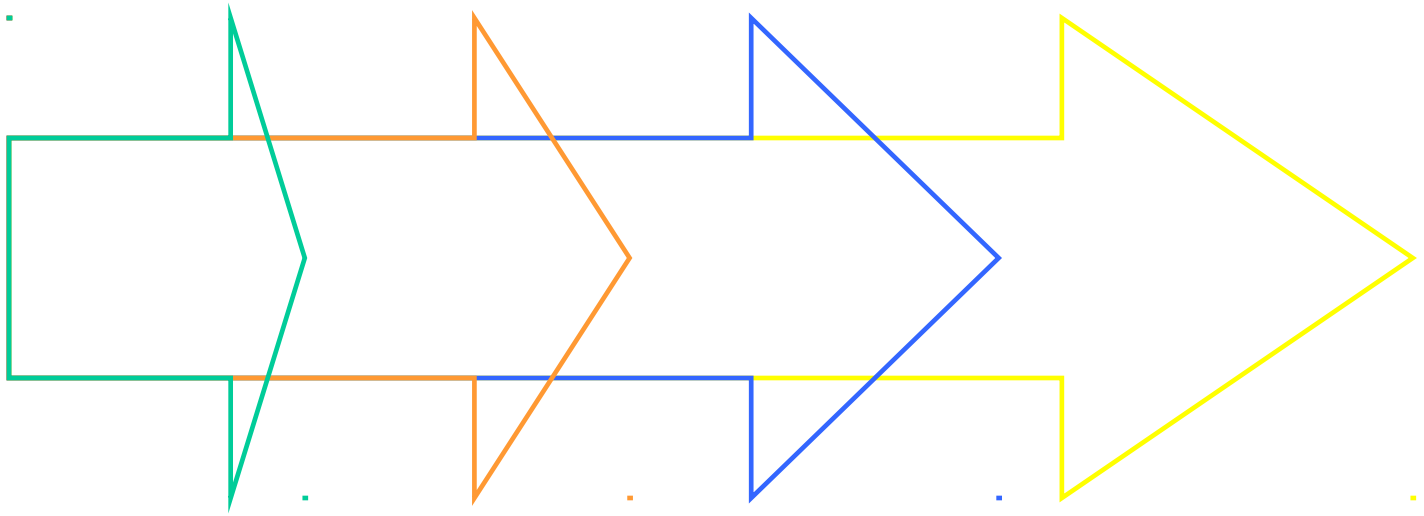
# Process Management



**All processes have three drivers that can be measured:**

- **Cycle Time= $\frac{\text{Actions in Process}}{\text{Processing Speed}}$**
- **First Pass Yield (FPY)**
- **Productivity**



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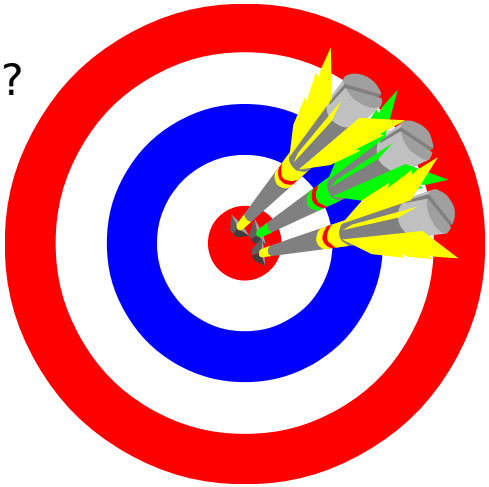
# First-Pass Yield

- Doing the right things?



AIP=Actions in Process

- **Doing things right the first time=FPY**

**FPY % = *AIPs* completed first time through according to specs x 100**

**Total *AIPs* Processed**

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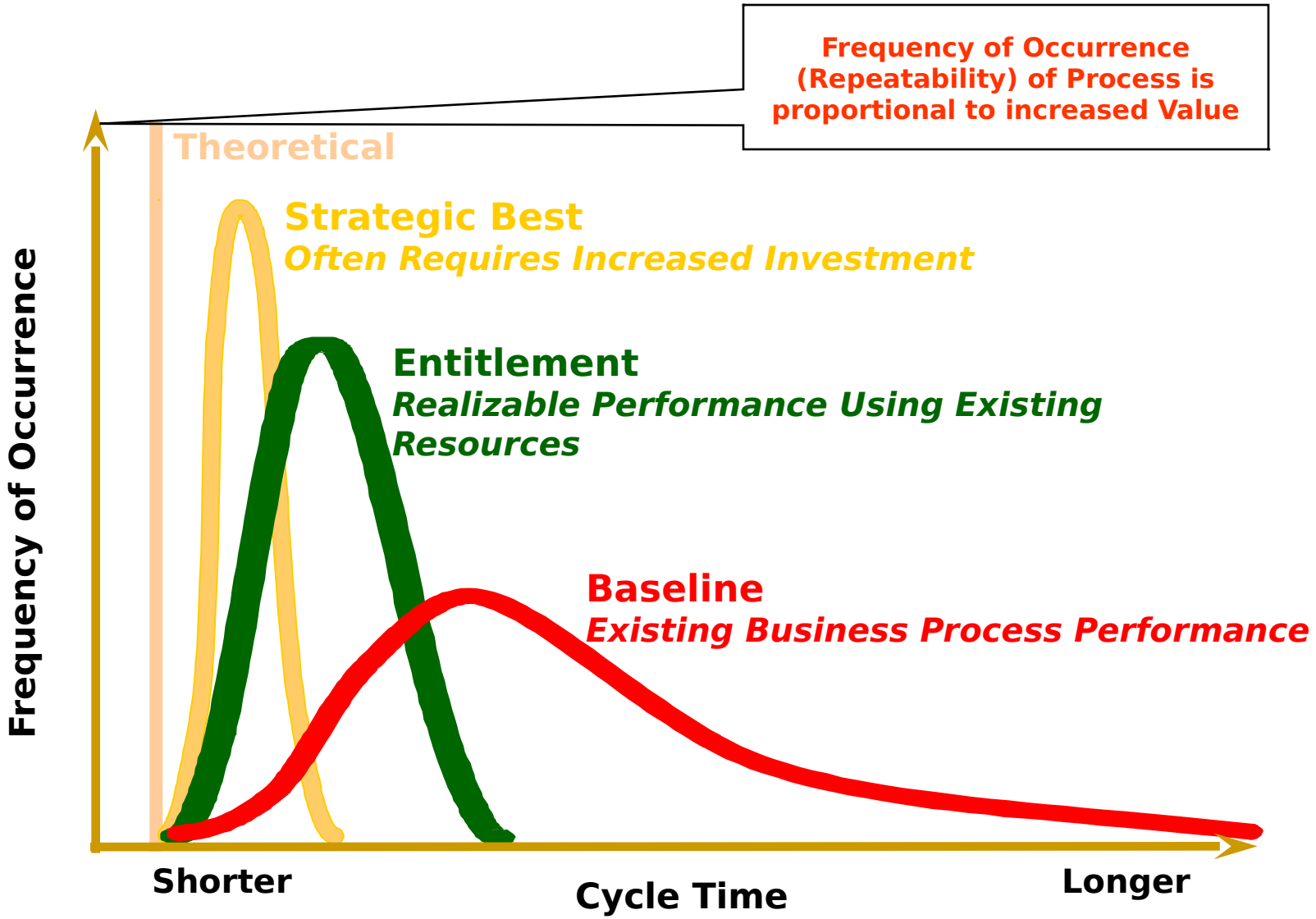
# Typical Performance Distributions



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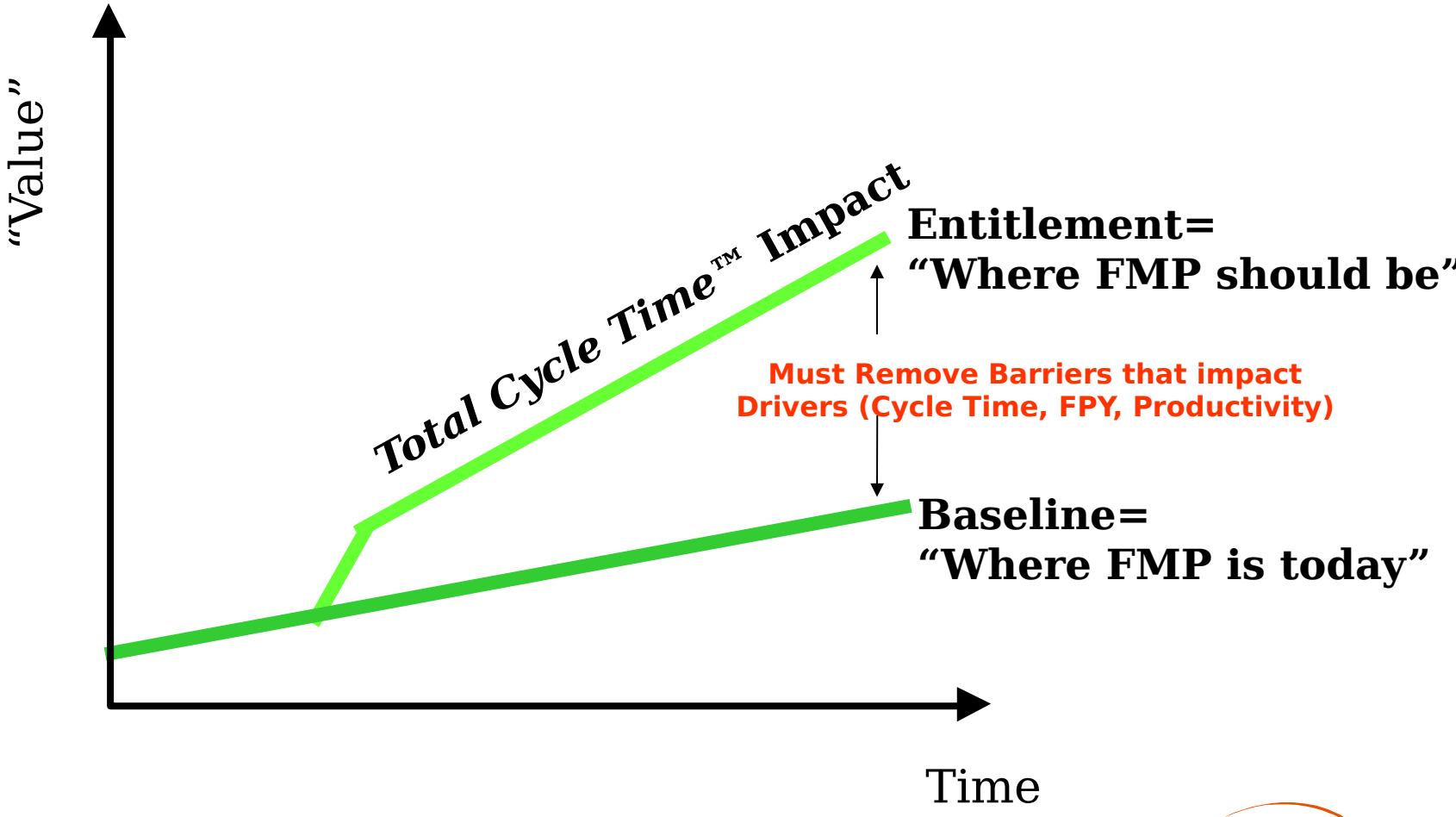
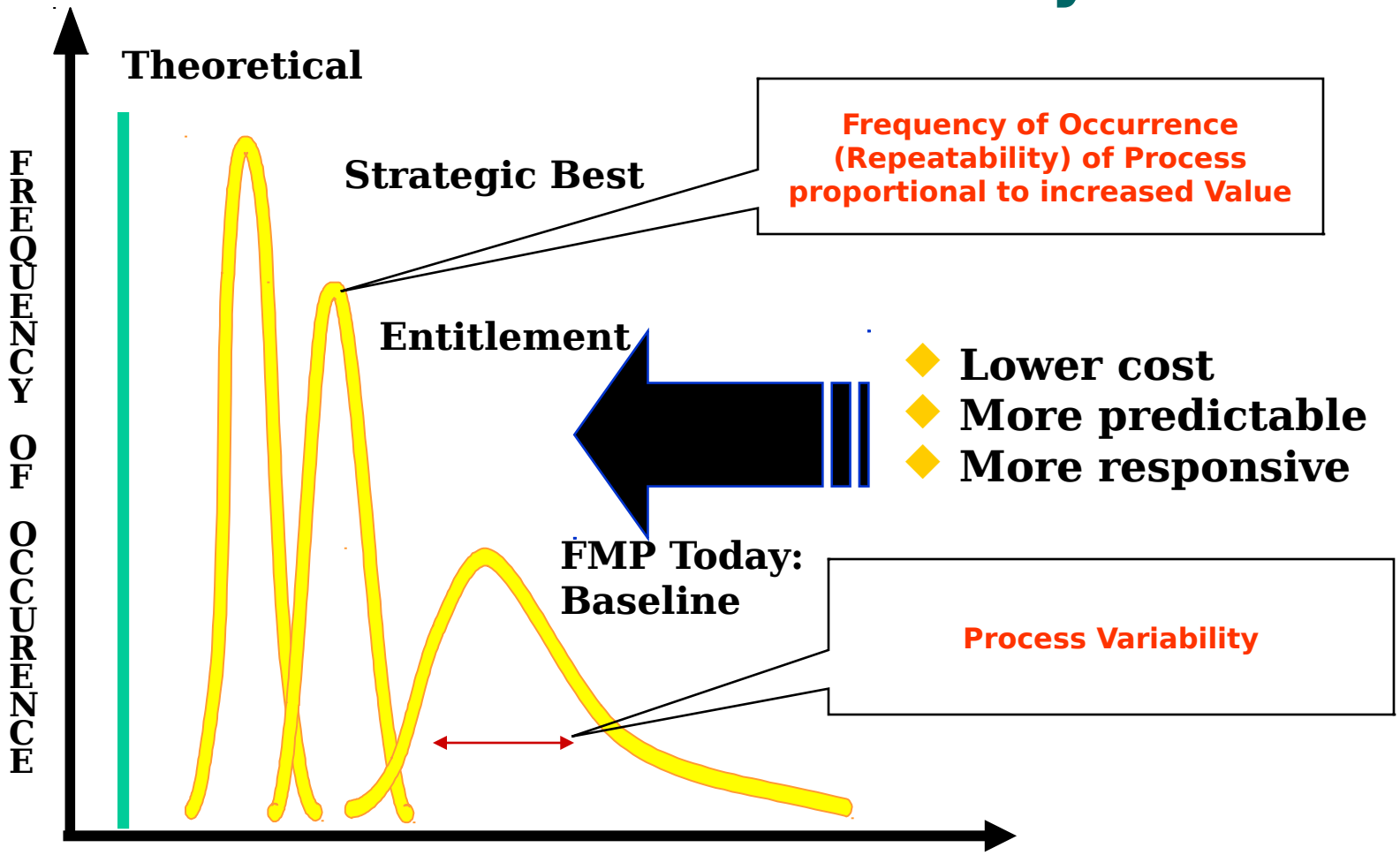
# Establish Baseline and Define Entitlement



# Drive for Predictability and Less Process Variability




***Shorter Cycle Time and Less Process Variability***



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# Examples of Barriers

- **Redundant Processes**
- Workarounds/”Sneak Circuits”
- Multiple Databases
- Stove-piped decisions
- Excess inspection/rework
- Lack of visibility
- Lots of Approvals
- Expediting (“Process Override/Waivers”)
- More People

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